IN THE CLAIMS

1. (Currently amended) A computer-based method of retrieving one or more items from at least one database in response to a query specified by a user via ~~at least one example set~~ a plurality of positive and negative example sets, the method comprising the steps of:

constructing a scoring function from the ~~at least one example set~~ plurality of positive and negative example sets, wherein the scoring function is operable for use with a multidimensional indexing structure capable of supporting similarity queries and associated with the at least one database; and

retrieving, via the multidimensional indexing structure, the one or more database items that have the highest score as computed using the scoring function.

2. (Canceled)

3. (Currently amended) The method of claim ~~2~~ 1, wherein the scoring function is constructed by combining respective scoring functions of the ~~multiple~~ plurality of positive and negative example sets.

4. (Currently amended) The method of claim 3, wherein combining the scoring functions of the plurality of positive ~~example sets~~ and ~~the~~ negative example sets comprises the steps of:

modifying the scoring functions of the plurality of positive ~~example sets~~ and ~~the~~ negative example sets so that the scoring functions of the positive example sets assign low scores to representative samples of the negative example sets, and so that the scoring functions of the negative example sets assign low scores to representative samples of the positive example sets; and

combining the modified scoring functions of the plurality of positive ~~example sets~~ and ~~the~~ negative example sets.

5. (Currently amended) The method of claim ~~2~~ 1, wherein the scoring function assigns a score to an element of a search space associated with the at least one database equal to the minimum

of: (i) the maximum of the scores assigned to the element by the scoring functions of the positive example sets; and (ii) the minimum of one minus the scores assigned to the element by the scoring functions of the negative example sets.

6. (Original) The method of claim 1, wherein the scoring function gives higher scores to database items that are more closely related to the query than to database items that are not as closely related to the query.

7. (Currently amended) The method of claim 1, wherein a scoring function is obtained for the each of the plurality of positive and negative ~~at least one~~ example ~~set~~ sets by:

computing a characteristic example from ~~the at least one~~ each example set;

computing a dispersion characterization of ~~the at least one~~ each example set in association with the characteristic example; and

using the characteristic example, the dispersion characterization, and one or more samples from the database to compute the scoring function.

8. (Original) The method of claim 7, wherein the characteristic example is a centroid, a median, or a mode computed over at least a portion of the example set.

9. (Original) The method of claim 7, wherein the dispersion characterization associated with the example set comprises a covariance matrix, a standard deviation, central moments, order statistics of differences, or third moments capturing asymmetry.

10. (Original) The method of claim 7, wherein the step of using the characteristic example, the dispersion characterization, and one or more samples from the database to compute the scoring function further comprises computing weighted distances between the characteristic example and the one or more samples from the database using the dispersion characterization to compute weights.

11. (Original) The method of claim 10, wherein the weighted distances are Euclidean distances or Minkowsky distances.

12. (Currently amended) The method of claim 1, wherein a scoring function is computed for ~~the at least one~~ each of the plurality of positive and negative example ~~set~~ sets by converting one or more semi-metrics obtained using the ~~at least one~~ each example set to one or more scores using a conversion function.

13. (Currently amended) The method of claim 12, wherein the semi-metrics are weighted Minkowsky distances from a representative sample of examples in ~~the at least one~~ each of the plurality of positive and negative example ~~set~~ sets, and further wherein weights are calculated using the examples in ~~the at least one~~ each example set.

14. (Currently amended) The method of claim 13, wherein the weights are the inverse of standard deviations of the examples in ~~the at least one~~ each example set.

15. (Currently amended) The method of claim 13, wherein the representative sample is a centroid of the examples in ~~the at least one~~ each example set.

16. (Original) The method of claim 12, wherein the conversion function is a monotonically non-increasing continuous function having a value equal to one at the origin and a value of zero at infinity.

17. (Original) The method of claim 16, wherein the conversion function is a monotonically non-increasing continuous function having a value of one between zero and a first threshold value and a value of zero after a second threshold value.

18. (Original) The method of claim 1, wherein the user specifies the number of items to retrieve from the database.

19. (Currently amended) The method of claim ~~2~~ 1, wherein the retrieving step further comprises the step of searching the multidimensional indexing structure to retrieve from the database the items having the highest score.

20. (Original) The method of claim 19, wherein the multidimensional indexing structure is used to execute different queries.

21. (Original) The method of claim 19, wherein the multidimensional indexing structure is based on a recursive partition of a search space associated with the database using hyperplanes parallel to coordinate axes or surfaces other than hyperplanes parallel to coordinate axes.

22. (Currently amended) The method of claim 19, wherein searching the multidimensional indexing structure comprises the steps of:

using scoring functions of the ~~multiple~~ plurality of positive and negative example sets to search a tree to identify candidate nodes; and

using the scoring functions of the ~~multiple~~ plurality of positive and negative example sets to score items stored at leaves of the multidimensional indexing structure.

23. (Original) The method of claim 22, wherein identifying candidate nodes comprises the steps of:

computing for each scoring function of the positive example sets, the maximum possible score of an item stored at the node or at one of the descendants of the node;

computing the maximum of the maximum scores;

computing for each scoring function of the negative example sets, the minimum possible score of an item stored at the node or at one of the descendants of the node;

computing the minimum of one minus the minimum scores;

computing the minimum of: (i) the maximum of the maximum scores; and (ii) the minimum of one minus the minimum scores;

comparing the computed minimum to the minimum of the scores in a current result set;

declaring that a node is a candidate if the minimum is not smaller than the minimum of the scores in the current result set; and

declaring that the node is not a candidate otherwise.

24. (Original) The method of claim 22, wherein the search is performed by using the scoring functions of the positive example sets one at a time in conjunction with the scoring functions of the negative example sets.

25. (Currently amended) Apparatus for retrieving one or more items from at least one database in response to a query specified by a user via ~~at least one example set~~ a plurality of positive and negative example sets, the apparatus comprising:

at least one processor operative to: (i) construct a scoring function from the ~~at least one example set~~ plurality of positive and negative example sets, wherein the scoring function is operable for use with a multidimensional indexing structure capable of supporting similarity queries and associated with the at least one database; and (ii) retrieve, via the multidimensional indexing structure, the one or more database items that have the highest score as computed using the scoring function; and

memory, coupled to the at least one processor, for storing at least a portion of results of one or more of the constructing and retrieving operations.

26. (Canceled)

27. (Currently amended) The apparatus of claim ~~26~~ 25, wherein the scoring function is constructed by combining respective scoring functions of the ~~multiple~~ plurality of positive and negative example sets.

28. (Currently amended) The apparatus of claim 27, wherein combining the scoring functions of the plurality of positive ~~example sets~~ and ~~the~~ negative example sets comprises: (i) modifying the scoring functions of the plurality of positive ~~example sets~~ and ~~the~~ negative example sets so that the scoring functions of the positive example sets assign low scores to representative samples of the negative example sets, and so that the scoring functions of the negative example sets assign low scores to representative samples of the positive example sets; and (ii) combining the modified scoring functions of the plurality of positive ~~example sets~~ and ~~the~~ negative example sets.

29. (Currently amended) The apparatus of claim ~~26~~ 25, wherein the scoring function assigns a score to an element of a search space associated with the at least one database equal to the minimum of: (i) the maximum of the scores assigned to the element by the scoring functions of the positive example sets; and (ii) the minimum of one minus the scores assigned to the element by the scoring functions of the negative example sets.

30. (Original) The apparatus of claim 25, wherein the scoring function gives higher scores to database items that are more closely related to the query than to database items that are not as closely related to the query.

31. (Currently amended) The apparatus of claim 25, wherein a scoring function is obtained for the each of the plurality of positive and negative ~~at least one~~ example ~~set~~ sets by: (i) computing a characteristic example from ~~the at least one~~ each example set; (ii) computing a dispersion characterization of ~~the at least one~~ each example set in association with the characteristic example; and (iii) using the characteristic example, the dispersion characterization, and one or more samples from the database to compute the scoring function.

32. (Original) The apparatus of claim 31, wherein the characteristic example is a centroid, a median, or a mode computed over at least a portion of the example set.

33. (Original) The apparatus of claim 31, wherein the dispersion characterization associated with the example set comprises a covariance matrix, a standard deviation, central moments, order statistics of differences, or third moments capturing asymmetry.

34. (Original) The apparatus of claim 31, wherein the operation of using the characteristic example, the dispersion characterization, and one or more samples from the database to compute the scoring function further comprises computing weighted distances between the characteristic example and the one or more samples from the database using the dispersion characterization to compute weights.

35. (Original) The apparatus of claim 34, wherein the weighted distances are Euclidean distances or Minkowsky distances.

36. (Currently amended) The apparatus of claim 25, wherein a scoring function is computed for ~~the at least one~~ each of the plurality of positive and negative example ~~set~~ sets by converting one or more semi-metrics obtained using the ~~at least one~~ each example set to one or more scores using a conversion function.

37. (Currently amended) The apparatus of claim 36, wherein the semi-metrics are weighted Minkowsky distances from a representative sample of examples in ~~the at least one~~ each of the plurality of positive and negative example ~~set~~ sets, and further wherein weights are calculated using the examples in ~~the at least one~~ each example set.

38. (Currently amended) The apparatus of claim 37, wherein the weights are the inverse of standard deviations of the examples in ~~the at least one~~ each example set.

39. (Currently amended) The apparatus of claim 37, wherein the representative sample is a centroid of the examples in ~~the at least one~~ each example set.

40. (Original) The apparatus of claim 36, wherein the conversion function is a monotonically non-increasing continuous function having a value equal to one at the origin and a value of zero at infinity.

41. (Original) The apparatus of claim 40, wherein the conversion function is a monotonically non-increasing continuous function having a value of one between zero and a first threshold value and a value of zero after a second threshold value.

42. (Original) The apparatus of claim 25, wherein the user specifies the number of items to retrieve from the database.

43. (Currently amended) The apparatus of claim ~~26~~ 25, wherein the retrieving step further comprises the step of searching the multidimensional indexing structure to retrieve from the database the items having the highest score.

44. (Original) The apparatus of claim 43, wherein the multidimensional indexing structure is used to execute different queries.

45. (Original) The apparatus of claim 43, wherein the multidimensional indexing structure is based on a recursive partition of a search space associated with the database using hyperplanes parallel to coordinate axes or surfaces other than hyperplanes parallel to coordinate axes.

46. (Currently amended) The apparatus of claim 43, wherein searching the multidimensional indexing structure comprises: (i) using scoring functions of the ~~multiple~~ plurality of positive and negative example sets to search a tree to identify candidate nodes; and (ii) using the scoring functions

of the ~~multiple~~ plurality of positive and negative example sets to score items stored at leaves of the multidimensional indexing structure.

47. (Original) The apparatus of claim 46, wherein identifying candidate nodes comprises: (i) computing for each scoring function of the positive example sets, the maximum possible score of an item stored at the node or at one of the descendants of the node; (ii) computing the maximum of the maximum scores; (iii) computing for each scoring function of the negative example sets, the minimum possible score of an item stored at the node or at one of the descendants of the node; (iv) computing the minimum of one minus the minimum scores; (v) computing the minimum of: (a) the maximum of the maximum scores; and (b) the minimum of one minus the minimum scores; (vi) comparing the computed minimum to the minimum of the scores in a current result set; (vii) declaring that a node is a candidate if the minimum is not smaller than the minimum of the scores in the current result set; and (viii) declaring that the node is not a candidate otherwise.

48. (Original) The apparatus of claim 46, wherein the search is performed by using the scoring functions of the positive example sets one at a time in conjunction with the scoring functions of the negative example sets.

49. (Currently amended) An article of manufacture for retrieving one or more items from at least one database in response to a query specified by a user via ~~at least one example set~~ a plurality of positive and negative example sets, the article comprising a machine readable medium containing one or more programs which when executed implement the steps of:

constructing a scoring function from the ~~at least one example set~~ plurality of positive and negative example sets, wherein the scoring function is operable for use with a multidimensional indexing structure capable of supporting similarity queries and associated with the at least one database; and

retrieving, via the multidimensional indexing structure, the one or more database items that have the highest score as computed using the scoring function.